

Photograph of the Cluster H VI. 30 Cassiopeiae.

By Isaac Roberts, D.Sc., F.R.S.

The photograph now presented was taken with the 20-inch reflector on 1892 November 26. Exposure 90 minutes. Scale 30 seconds of arc to one millimetre. R.A. $23^{\text{h}} 52^{\text{m}}$; Decl. N. $56^{\circ} 8'$, at the centre.

The following description is given by Sir John Herschel in the *Phil. Trans.* for 1833, p. 480 :—"A most superb cluster which fills the field and is full of stars; generally brighter in the middle but no condensation to a nucleus. Stars 11th to 18th magnitude.

Lord Rosse, in his "Observations of Nebulae and Clusters of Stars," p. 177, describes the cluster as very coarse; stars quite distinct and no visible nebulosity; dark holes and jagged branches, but no regular arrangement.

The photograph shows the cluster to be in fair accord with the descriptions given by Herschel and Rosse as far as they apply; but in addition it shows patterns, consisting of lines, wreaths, and curves of stars, which on the negative are very prominent features. The photograph confirms the eye observations, that there is no nebulosity in the cluster, and, since it shows every star in its true relative position and magnitude, down to about the 16th, the further evolution of this cluster may henceforth be strictly followed by us and by our successors.

The Eclipse of the Moon, 1892 November 4-5. Observed at Sydney Observatory.

(Communicated by H. C. Russell, B.A., F.R.S., Government Astronomer.)

The weather was most unpromising for observation, owing to the ever-changing and too abundant clouds; however, at $11^{\text{h}} 45^{\text{m}}$ through a break in the clouds, a slight shade, the effect of the penumbra, was visible on the eastern limb of the Moon, and the first contact with the shadow was seen at $12^{\text{h}} 14^{\text{m}} 20^{\text{s}}$. At $12^{\text{h}} 17^{\text{m}}$ the first photograph was taken, and a few minutes later an extensive cirrus-cloud covered the Moon, and a large halo was visible for a time. The cloud continued to increase, and interfered very much with observation. There was no sign of coppery colour, the shadow being so dark—a very dark brown, almost black—that it entirely blotted out the Moon's limb and markings on the surface, which are usually seen through it on such occasions. At $12^{\text{h}} 43^{\text{m}}$ a partial break in the cloud gave opportunity for another photograph, exposed 30^{s} . At $12^{\text{h}} 53^{\text{m}}$ the Moon was half eclipsed and the clouds had become thicker, so much so that no features of the Moon were visible through the shadow or eclipsed part of the Moon. At $12^{\text{h}} 55^{\text{m}}$ another photograph was taken, and the exposure was increased to 1^{m} .

At 1^h 28^m A.M. the eclipse was announced to become total, but here the Moon did not become wholly involved in the shadow.* The white strip of Moon visible at the total eclipse travelled round the northern limb of the Moon as the eclipse proceeded.

At 2 A.M. clouds cleared a little, and it could be seen by its coppery tint that the Moon was passing gradually out of the very dark part of the Earth's shadow-cone into a lighter part, in which the usual coppery-red light was bright enough to illuminate the Moon. On the northern side of the Moon, and extending upwards, the red or coppery colour seemed to involve three-fourths of the Moon, and a few minutes later—2^h 10^m—the Moon had passed altogether out of the dark shadow, and the whole of it was visible in red light. At 2^h 12^m, the end of total eclipse, the white patch already referred to was on the N.E. side, and the colours on the Moon were unusually beautiful. A minute white crescent on the N.E. was fringed by greenish-grey light, which seemed to extend the crescent half round the Moon and hold in its grasp a brilliant coppery-red ball, the whole Moon, of which the lightest red was next the greenish-grey crescent, presenting altogether the most beautiful view of an eclipsed Moon that I have ever seen. At 2^h 30^m A.M. clouds again covered the Moon until six minutes past 3 A.M. At 3^h 8^m A.M. another photograph was taken. The coppery colour had gone, and the shadow on the Moon looked nearly as black as it did at the beginning of the eclipse. At 3^h 24^m A.M. another photo was taken. The last contact was observed 3^h 26^m A.M., and the penumbra still cast a faint shadow over part of the Moon, and three minutes later clouds again claimed possession. Six successful photographs of the Moon were obtained.

Observatory, Sydney N.S.W.:
1892 November 5.

Estimations of Magnitude of Nova Aurigæ, made at the Radcliffe Observatory, Oxford. By E. J. Stone, M.A., F.R.S., Radcliffe Observer.

Estimations of the magnitude of the Nova have been made on the following nights: 1892 November 18, 26; December 9, 12, 22, 23; and 1893 January 2 and 10. The mean magnitude given by these observations is 9.7, and it would appear that no sensible changes of magnitude have taken place during the interval over which these observations extend.

Radcliffe Observatory:
1893 January 12.

[* The Superintendent of the N. A. kindly informs us that "the Moon's centre was north of the shadow's centre, so that the Moon's north limb was close to the edge of the shadow, and small errors in adopted values might make it visible. The diameter of the shadow is increased in a certain proportion for one thing, but this assumed enlargement probably varies with the atmospheric conditions at the time of each eclipse."—SECRETARIES.]